

ABSTRACT

The inventors focused their attention on the disposition configuration of air-core coils so that, while vibrations through centrifugal force are appropriately generated, high efficiency is obtained and assembly is easy, and, by disposing an eccentric weight in such a constitution, a large amount of vibration is obtained. To achieve this, a plurality of armature coils having at least one winding-type air core armature coil is disposed in an eccentric manner on a printed wiring board; a commutator is disposed on a first side of the printed wiring board, and a resin shaft holder is disposed on the second side; outward of this resin holder, the air-core armature coils are disposed and a sintered oil-impregnated bearing is contained in the shaft holder; an eccentric weight is disposed so as not to overlap with at least one winding-type air-core armature coil; a connector terminal part is provided so as not to overlap with the air-core armature coils; a shaft supporting this eccentric rotor is fixed by laser welding beforehand to the casing from the outside so that a first end thereof does not project outside of a housing; a magnet that imparts a magnet field to the eccentric rotor via an axial air gap, a brush that imparts electric power to the air-core armature coils via the commutator, and a housing comprising the casing and a bracket and containing the aforementioned are provided; and after the eccentric rotor is mounted on a second end of the shaft so as to be rotatable, [the shaft] is received and stopped by the bracket and prevented from moving in the radial direction.